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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,793	09/17/2003	Jun Takeuchi	33082M177	3772

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SMITH, GAMBRELL & RUSSELL  
1850 M STREET, N.W., SUITE 800  
WASHINGTON, DC 20036

EXAMINER
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BAREFORD, KATHERINE A

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 11/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/663,793

**Applicant(s)**

TAKEUCHI ET AL.

**Examiner**

Katherine A. Bareford

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) 5-8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 9/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election with traverse of Group I, claims 1-4 in the reply filed on October 5, 2006 is acknowledged. The traversal is on the ground(s) that all of the product claims in Group II are product by process claims necessarily including all of the process steps defined in the method claims of Group I, and all Group II claims 5-8 depend from the method claims of Group I. This is not found persuasive because, as discussed in MPEP 806.05(f):

A product defined by the process by which it can be made is still a product claim (In re Bridgeford, 357 F.2d 679, 149 USPQ 55 (CCPA 1966)) and can be restricted from the process if the examiner can demonstrate that the product as claimed can be made by another materially different process; defining the product in terms of a process by which it is made is nothing more than a permissible technique that applicant may use to define the invention.

Here, the product as claimed can be made by another and materially different process such as physical vapor deposition or chemical vapor deposition of the layers.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 5-8 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on October 5, 2006.

*Specification*

3. The abstract of the disclosure is objected to because it is more than 150 words in length.

Correction is required. See MPEP § 608.01(b).

*Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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6. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted state of the prior art in view of Rice et al (US 2003/0154919) and Japan 05-278038 (hereinafter '038).

The admitted state of the prior art, at pages 1-4 of the application, teaches that it is well known to provide an internal member to be disposed in a vacuum processing apparatus in the form of an electrostatic chuck. It is known to provide this electrostatic chuck with holes formed on the surface as gas injection holes. Furthermore, it is known to deposit a coating film of ceramic material onto the surface of this chuck by means of plasma spraying. Furthermore, the admitted state of the prior art teaches that in order to form the ceramic coating film on the chuck with gas injection holes, it is required that coating material not enter the holes. The admitted state of the prior art teaches that known methods of <sup>masking</sup>~~making~~ the holes would include using padding plugs of metal, which suffer from the problem of the coating material conjugating to the metal material of the padding plugs, with removal of the plugs being a problem because they are welded to the coating film.

The admitted state of the prior art teaches all the features of this claim except the use of the metal padding plug coated with a metal-resin composite layer as claimed and removing the padding plugs after coating.

However, Rice teaches using a masking apparatus in a thermal spray process. Figure 4B and paragraphs [0040] – [0041]. In Rice, a cup 62 is provided as the mask that can be made of a material such as thin sheet metal including aluminum or steel that can

withstand the temperature of droplets from the thermal spray device. Figure 4B and paragraphs [0040]-[0041]. Rice teaches that the cup can be further supplied with a coating to reduce the adherence of thermal spray droplets, such as TEFLON or a mold release coating. Paragraph [0044].

'038 teaches that a desirable mold release coating for a material such as steel is provided by electrolessly plating the mold with nickel containing 5-25 volume % polytetrafluoroethylene (PTFE), producing a coating of a composite of nickel metal and PFTE resin. See the Abstract. While an example has P also present, this is merely exemplary, and only nickel and PTFE are required.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the admitted state of the prior art to use metal padding plugs that have been coated with a nickel-PTFE release coating to mask the gas holes during coating as suggested by Rice and '038 in order to provide an metal padding plug that does not stick to the coating material, as the admitted state of the prior art teaches the thermal spraying, by plasma spraying, of chucks with holes that need to be masked during spraying and that the use of metal padding plugs during spraying has the problem of the coating material conjugating to the metal material of the padding plugs, with removal of the plugs being a problem because they are welded to the coating film, and Rice teaches that thermal spray masking devices are desirably provided with a mold release coating to prevent thermal spray material from sticking to the masking device, and further teaches that TEFLON (also known as PTFE) is also a material to

which thermal spray coatings do not stick, and '038 teaches that a desirable mold release coating is a combination of nickel and PTFE. Thus, the use of the suggested mold release coating on the masking padding plug will remove the problem of spray material conjugating or sticking to the plugs. It further would have been obvious to modify the admitted state of the prior art in view of Rice and '038 to remove the padding plugs after coating with an expectation of providing a desirable use of the chuck, because the plugs would need to be removed so that the gas injection holes could be used for injecting gas as desired.

7. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted state of the prior art in view of Rice and '038 as applied to claim 1 above, and further in view of WO 01/54188 (hereinafter '188), Pico, deceased et al (US 4115507) and Sherstinsky et al (US 5634266).

\*\*\*\* The Examiner notes that '188 is in Japanese and therefore, Harada et al (US 2003/0007308) the US national stage application of '188 has been used as a translations, and column and line references are to Harada. \*\*\*\*

The admitted state of the prior art in view of Rice and '038 teaches all the features of these claims except (1) the surface material of the chuck (claims 2, 4), (2) the hole diameters (claims 2, 4), (3) the core member of steel wire (claims 2, 4), (4) the thickness of the metal-resin composite layer (claims 2, 4), (5) the projection of the plugs (claims 2, 4), (6) the multiple layers (to provide electrode layer embedded in insulating layer

(claim 3). As to the core member material, Rice teaches that the base mask material to be coated can be steel, and '038 teaches that the substrate can be steel as discussed in the rejection above. As to the insulating material coating film, the admitted state of the art teaches that it is known to plasma spray aluminum oxide. Page 2. As to the electroless plating of nickel with fluoropolymer (PTFE) particles dispersed therein, this is taught by '038 as discussed in the rejection above.

'188/Harada teaches that it is known to provide an electrostatic chuck member with layers of insulating material of oxide ceramic such as aluminum oxide with an electrode layer applied between the aluminum oxide layers. Paragraph [0026] – [0027]. The chuck substrate surface material can be aluminum. Paragraph [0052]. A layer of nickel-aluminum alloy can be provided on that surface providing an aluminum alloy surface contacting the insulating layers. Paragraph [0052]. An aluminum oxide layer can be plasma sprayed over the aluminum and aluminum alloy surface. Paragraph [0052]. Then a tungsten electrode layer is plasma sprayed over the aluminum oxide layer. Paragraph [0052]. Then another aluminum oxide layer is plasma sprayed over the tungsten layer. Paragraph [0052].

Pico teaches using masking plug to prevent coating areas of a substrate with perforations, or holes, with the plugs inserted into the perforations. Column 4, lines 50-55 and column 1, lines 25-35. The plugs extend past the substrate surface a distance desirably at least twice the thickness of the coating to be applied to facilitate removal of



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the plug after coating. Column 4, lines 55-65. The plugs can be metal and can be coated with a release agent to help prevent coating from sticking. Column 5, lines 1-15.

Sherstinsky teaches that when providing electrostatic chucks with gas injection holes, the holes can desirably be 0.5 mm, for example. Column 5, line 60 through column 6, line 10.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to (1) (6) modify the admitted state of the prior art in view of Rice and '038 to use aluminum/aluminum alloy surface materials and to provide an

aluminum oxide insulating layer by plasma spraying, followed by a tungsten electrode

layer by <sup>plasma</sup>~~thermal~~ spraying, followed by an aluminum oxide insulating layer by plasma spraying as suggested by '188 with an expectation of providing a desirable electrostatic chuck, because the admitted state of the prior art in view of Rice and '038 teaches to apply plasma sprayed material to an electrostatic chuck with cooling holes and to mask the cooling holes with plugs during spraying, and '188 teaches that a desirable

electrostatic chuck includes aluminum/aluminum alloy surface materials and an aluminum oxide insulating layer provided by plasma spraying, followed by a tungsten

electrode layer provided by <sup>plasma</sup>~~thermal~~ spraying, followed by an aluminum oxide insulating layer provided by plasma spraying. It would have been obvious to use the padding plug process as taught by the admitted state of the prior art in view of Rice and '038 for each layer (during the tungsten layer application, metal plugs alone would be obvious to use if the tungsten does not stick as aluminum oxide would or the claimed

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metal plug would also read on the metal coated plug used with the aluminum oxide layers) in order to prevent blocking the holes during each process. (5) It would further have been obvious to modify the admitted state of the prior art in view of Rice, '038 and '188 to optimize the projection height of the plugs beyond the surface by routine experimentation as suggested by Pico in order to provide optimum plug removal, because the admitted state of the prior art in view of Rice and '038<sup>and '188</sup> teaches to use masking padding plugs during the coating and Pico teaches that when masking holes using plugs it is desirable to project them at least twice the height of the coating to be applied to allow for easy removal, which suggests optimizing the height of the plugs. (2) It would further have been obvious to modify the admitted state of the prior art in view of Rice, '038, '188 and Pico to use a hole diameter of 0.5 mm as suggested by Sherstinsky in order to provide desirable gas injection, because the admitted state of the prior art in view of Rice, '038, '188 and Pico teaches to use an electrostatic chuck with gas injection holes, and Sherstinsky teaches that electrostatic chuck gas injection holes can desirably be 0.5 mm in diameter. (3) It would further have been obvious to modify the admitted state of the prior art in view of Rice, '038, '188, Pico and Sherstinsky to use steel wire as the core member, because the admitted state of the prior art teaches to use a metal base, Rice teaches to use a base masking material of steel, and Sherstinsky teaches that the holes to be plugged would only be 0.5 mm in diameter, and thus the base material would be steel in the shape of a wire. (4) It would further have been obvious to modify the admitted state of the prior art in view of Rice, '038, '188, Pico and

Sherstinsky to optimize the coating thickness based on the size of the metal plug and holes to be coated and the amount of protection needed, as '038 teaches that particles of 1 micron of PTFE (abstract) can be used, thus allowing for a coating of 1 micron or more thickness.


### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
KATHERINE BAREFORD  
PRIMARY EXAMINER